

# COLOR IN ARCHITECTURE

THE BASIC PRINCIPLES OF  
ITS APPLICATION IN AVAILABLE  
MEDIUMS



· NATIONAL TERRA COTTA SOCIETY ·  
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## FOREWORD



THE following treatise originally appeared as a series of articles published in *The American Architect and Architectural Review* during the months of September and October, 1922, and through the courtesy of the publishers of that magazine the National Terra Cotta Society is enabled to re-publish these articles in brochure form.







WINDOWS IN THE COURT OF THE PALACE OF GALEAZZO VISCONTI AT PAVIA,  
NEAR MILAN, ITALY.

FROM THE RESTORATION BY F. LOSE

But a fragment of this once magnificent 14th Century dwelling was standing in 1867 when the restoration above was made. Bernardino of Venice appears to have been among the architects responsible. The maximum of positive decision characterized the use of color in terra cotta, marble, brick and painted decoration.





# COLOR IN ARCHITECTURE

BY F. S. LAURENCE

Executive Secretary, National Terra Cotta Society

EVERY building erected necessarily presents a color scheme. The following pages aim to give some of the broad fundamental principles of the successful use of color through employment of the materials which must be the medium of its expression in architecture. Literature that is of practical help in this relation is unfortunately quite limited. A number of works exist on the phenomena of color, the laws of harmony and theory of complementary shades, among which Chevrue's work, translations of which may be found in our public libraries, is perhaps the most useful in its complete and exhaustive treatment of the subject. This existing literature, however, is all so highly technical and scientific in its nature that there is need of a simple statement of the basic principles of application in architecture and the use of available mediums.

The first necessity is a correct interpretation of the term "color." In the employment of the word there is much confusion of thought, "color" being too frequently used to define only an expression in polychrome design and usually to denote the treatment of detail in shades of green, blue, yellow, etc. The term polychrome is also used sometimes to describe contrasts of tone in one color or in black and white which may also be used to enrich ornament or define pattern.

Consideration of the subject should start with recognition of the term "color" as covering any possible result in the use of any material, whether in one or in several colors. There is no material employed in architecture which has not color, whether it be any of the varieties of natural stones, marble, brick, terra cotta or even cement. All have a



Polychrome treatment of a tile house in Mexico City

This is a characteristic detail of the lavish use of polychrome in blue, orange, green and white coloring for paneled surfaces with carved stone trim. Shadow also plays a pronounced part in the chromatic effect together with brilliant coloring in the awnings and other accessories

certain chromatic interest proceeding from the nature of the elements composing them even where no artificial color interest is introduced in manufacturing or finishing processes. White and black which are not colors in the strict meaning of



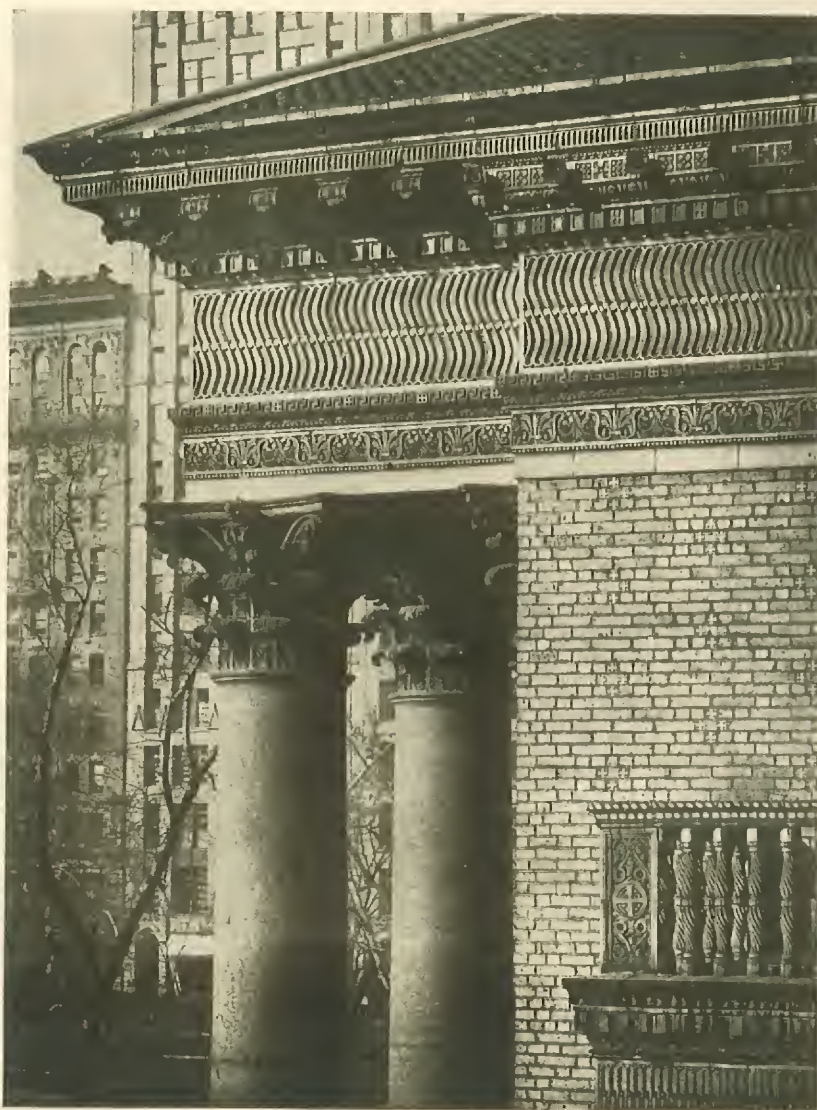
the term nevertheless have a positive interest which may be described as chromatic and for the purposes of this article will be included under the term color as hereafter used.

The statement that every building erected presents a color scheme is something more than the trite expression of an undisputed fact. It brings into view the law of association in mental process which must be taken into account in solving the color problems of architectural design.

#### INFLUENCE OF FAMILIAR EXAMPLES: SINCERITY

To realize the importance of this factor apply a test easily open to the resident of any average American city. Stroll through any of the streets and note the number of familiar buildings which have not heretofore registered on your consciousness an impression of any chromatic interest. You will be surprised to note the gamut of color represented in these familiar instances, taking the street as a whole. Here are a few colors noted in the space of one city block in the midtown business section of New York, referring only to materials used in construction and excluding awnings, signs, and other accessories: red, green, blue, yellow, brown, gray, purple, black and white, in quantity, and in great variety of each color.

To mention the effect, or non-effect, upon consciousness, of one very positive color by way of illustration. Red greets us on every hand in the façades of brick buildings and is dismissed as not illustrating any use of color from its prevalence as a familiar commonplace. The attitude of mind would be markedly different were the same color, identically, to be used as a field for the walls of a stucco dwelling, or such a modification of it as would register on the eye an equal intensity of prevailing color to that occasioned by the brick and mortar joint together. Here we would have the impression of a "color stunt" and probably a quite ugly one at that. Now why? Cement can be artificially colored and given an interesting broken texture. Delicate pink, a modification of red,



Detail of entablature, Madison Square Presbyterian Church

Polychrome coloring was employed with great richness in this feature. Blue, green, yellow, sienna and gold were distributed throughout relief harmonizing with the rich warm gray of the brick wall below and serving as a transition to the culminating use of color in the pediment

would not offend. This, and various shades of yellow and gray are beautiful and perfectly legitimate in stucco. Why not red, and as bright as obtainable in any brick? Red walls are beautiful when expressed in skillful brick design. Why not in stucco? There is nothing in the laws governing the harmonious relation of colors in the abstract and their application to structural form which forbids.

The answer is to be found in our habit of associating certain color effects with certain materials and no effective study can proceed which ignores this as a powerful factor in solving the problems of chromatic treatment. But it does not follow that we are bound by it against any departure from the sphere of familiar things nor that





Madison Square Presbyterian Church, New York City

McKim, Mead & White, Architects

An epochal modern achievement in the successful relation of brick, granite, marble and terra cotta. Points in its successful treatment are noted in the illustration of details. The completion of this work greatly stimulated interest in the possibilities of polychrome design in America and may be regarded as initiating the present widespread production of polychrome glazes in exterior terra cotta. Destruction of this building to make way for a skyscraper has been justly regarded as a distinct loss to American architecture. The tympanum feature of the pediment has been preserved by permanently installing in one of the wings of the Metropolitan Museum of Art, New York City.

doing so necessarily involves something more startling and bizarre than what we already have in "safe" conservative examples of design. Looked at with new eyes some of these are pretty pronounced chromatic "stunts" measured by the standards of abstract color relationships.

But the use of color in architecture cannot be reduced to the abstract and be determined by any pure theory of color and the principles of harmony alone. In architecture color cannot be disassociated from the problems of formal expression and

priate to their nature. Without observance of this the first great principle of all vital design, sincerity, cannot be realized.

#### QUALITY AS AN ELEMENT OF COLOR

Granting the correct interpretation of the term color to mean the chromatic interest of an entire building we are brought to the question of how far we can proceed to a consideration of the uses of color from the sound basis of sincerity defined in the preceding chapter as the first principle



Pediment of Madison Square Presbyterian Church where color treatment of terra cotta culminated in the strong contrast of white upon blue in the tympanum with touches of sienna and gold. The paneled face of architrave was in richly colored marble framed in terra cotta, the capitals and ceiling of porch being likewise developed in rich polychrome, blue predominating

the significance in this of the materials used. The nature of material should be evident. This is enforced by the principles of organic constructional design. The materials should retain and show the characteristics with which nature and necessary process endow them or admit applying to them fittingly, as in the case of paint upon wood. Manufactured products having definitely marked characteristics in color enforced by essential process, like brick, terra cotta and various ceramics should hold to these qualities of coloring and those which the mind will instinctively recognize as appro-

for observance. Before attempting any outline of the further principles of use to be observed there remains the fundamental matter of appreciating the meaning of the term "quality" as applied to color, since without this no observance of the principles of harmony and contrast in the relationship of colors to one another enables a result satisfying to the cultivated æsthetic sense. As a rule professional readers need no definition of the term as generally used in art; those who may be less familiar with the use of color may identify "quality" as "that characteristic in which unpleasant harsh-





Holy Well at Guadalupe, Mexico

The splendid polychrome tile dome of this ancient edifice is one of many examples to be found throughout Mexico, mainly, however, in Puebla. Brilliant orange, green and blue coloring was employed for the dome and recalled in the wall and parapet features above cornice and in the tile bands framing the plain wall surfaces below



ness and crudity are not only avoided, but the effects produced are attended with a positive charm not readily described. Perhaps the word sympathy may express it. This quality may be found in colors of the strongest brilliance and carrying power as well as in tints of the subtlest delicacy."\* The term may also denote the qualification of one color toward the characteristics of another. Broadly, however, it refers to the characteristic which gives any color an appeal to the cultivated æsthetic sense.

Recognition of what constitutes "quality" in

course of landscape sketching in color pursued systematically through later practice as many architects indeed do for recreation, would go far to equipping the designer with that sensitive appreciation of qualities, tones and values of color which would vivify his creations with the color quality they sometimes do not possess. Close study of the extreme subtleties of nature's color palette under varying conditions is the best training of the color sense yet afforded by any line of study, providing only that the follower of architecture continues to recognize the necessary self-assertion of the me-



The Fulton Theatre, New York City

Henry B. Herts, of Herts & Robertson, and Hugh Tallant, Architects

Harmony and richness are well exemplified in the treatment of this building. The material used was terra cotta throughout excepting the painted panel under cornice which is in colored cement, and the reveals of arched doorways which are in highly colored glass mosaic. Diaper pattern of walls is developed in deep amber yellow and ivory with blue spots at the intersections of lattice, this blue being recalled in the brackets, soffit and fret ornament of the cornice. The design illustrates splendidly a consistent use of material in a color scheme of the most positive character

a single shade unrelated to other colors is the first essential to realizing it in a complex of many colors occurring in the terms of a design. Both in his scholastic training and subsequent practice the architect is obliged, however, to work largely in black and white and this does not tend to his visualizing in terms of color. A

\*From an article by the writer in *The Architectural Record* of January, 1907.

diums of the latter art, considered as material, and does not allow his point of view in that relation to be swamped by the painter's disregard of it in realizing the effects of pictorial composition. An analogy to this exists in the respective problems of presentation encountered by the painter and the sculptor. One works from the standpoint of simulating form and the other from the standpoint of actually realizing it. The architect, like the





POLYCHROME TREATMENT OF TERRA COTTA, FULTON THEATRE, NEW YORK CITY  
HENRY B. HERTS AND HUGH TALLANT, ARCHITECTS





sculptor, must realize in tangible form and must preserve this expression against any tendency to obscure this in the application of color which the aims of the painter might entail.

#### FORM SHOULD REMAIN DOMINANT

This brings us to the second principle in an intelligent use of color in architecture — that form must remain dominant and coloration emphasize and sustain this dominance. Here an analogy may best be drawn from the problem of the mural painter in properly preserving the sense of wall surface and not making holes of his wall panels. The mural decorations of Puvis de Chavannes illustrate the complete observance of this principle in their masterly subordination to the requirements of surface and architectural form.

It is in this point that much of what has been written casually on the subject in relation to architecture proceeds eventually up a side track and halts dead against the bumper of an inflexible formula. We have it that color should not be employed upon supporting members as its use tends to obscure form and destroy the sense of supporting function. In any proper understanding of the term "color" how is its use to be avoided in these members? Color is everywhere with us in every material used and on the theory propounded a brick pier conveys no sense of support and the use by the late Stanford White of richly colored granite for the columns of the portico of the Madison Square Presbyterian Church in New York was a chromatic misapplication. Theories are useful when they are the servants and not masters of

thought and action. All we can safely deduce in this relation is the general principle that the choice and application of colors must not tend to destroy the sense of support where it should remain evident. Just what use of color will or will not do so in a given instance remains for the eye to determine by trial. It is easy to conceive that contrasting colors applied horizontally to a column would

so break its vertical continuity of appearance as to destroy the sense of its mass and supporting function when a vertical use of the same colors might not do so. Also that the use of a single pronounced dark color for a detached column against a background of the same color might so lose the column to sight that the surmounting entablature would be left hanging in the air.

The first step should be a color sketch for the effect in ensemble of the whole building. This should precede final scale drawings and full size details. Some architects find a colored cardboard model preferable. It is also best to have duplicate plaster casts made of certain full size models of important detail and

work out the color scheme to finality on these. This involves very little extra expense to the architect and is highly desirable as color may have to be intensified in the full size to approximate the relational effects indicated in the small scale model or drawing, delicate indications in the latter sufficing in its small scale but becoming ænemic if matched in full size. Coloring of full size casts when employed can be with tempera or ordinary oil paints but in all such cases a series of colored terra cotta samples in the form of small tile blocks should be at hand for approximating the



"Assumption of the Virgin" Altar piece in enameled terra cotta by Andrea Della Robbia, Metropolitan Museum of Art, New York City

An example of Andrea's work now in America. The heads of the Virgin, one cherub and three of the standing figures are modern restorations. These restorations suggest the ready possibility of approximating the splendid effects of original Robbia sculpture in modern terra cotta. The coloring of this example is the characteristic use of white figures on a blue ground with touches of other color in the minor details



qualities of color obtainable under ceramic process. Where effect of full glaze instead of matt finish is desired this may be accomplished by varnishing afterward.

It also remains for the eye to determine by trial the effectiveness of color relations upon form as these may occur in frieze, pediment, cornice, architrave and all other elements of structural design. Similarly the theory of complementary colors and their mutually enhancing effect is a resource to be employed within the broad reservation that what constitutes taste and will yield that jealously cherished objective, "safety" of design in its visual aspect, is something that no rule can assure.

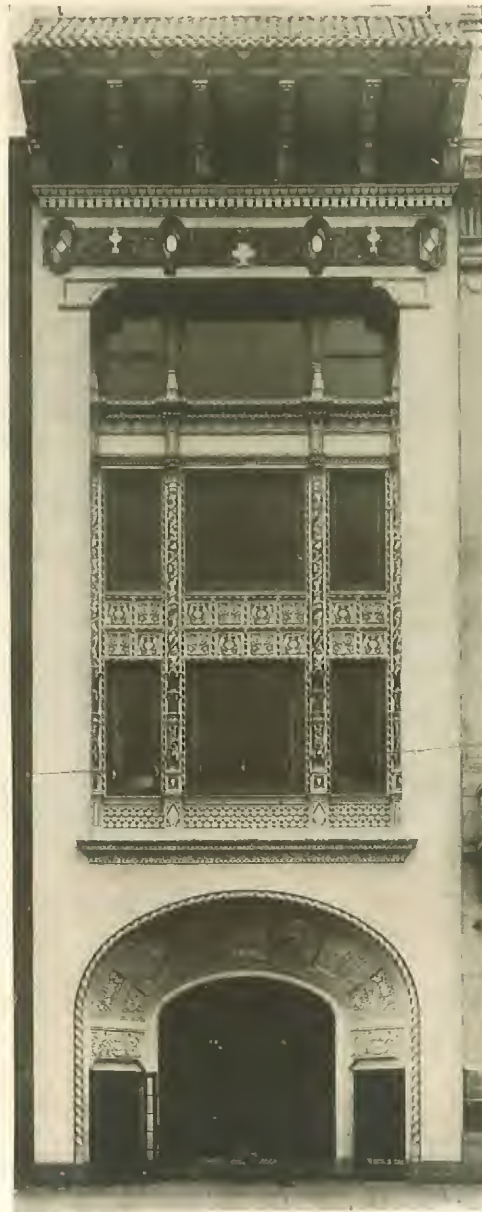
There can be no progress however if timidity is to rule in this regard. With the wealth of successful precedent existing in the lavish use of polychromy by the ancient Greeks, the rich resources for inspiration also to be found in the terra cotta architecture of Renaissance Italy, not to mention the ceramics of Moresque Spain and the superb instances of oriental tile work in Persia it is difficult to see why a more confident and widespread employment of color has not been attempted in contemporary architecture. The materials exist in the resources of modern manufacture in very much broader degree and public acceptance of the result is merely a matter of its familiar presence.

#### UNITY OF CHROMATIC ENSEMBLE

Unity is another fundamental principle in successful color design. Such an application of color as would tend to destroy the appearance of structural function would, of course, violate the requirements of formal design however the use of color might hold together as mere chromatic

composition. Considered in the latter relation purely, unity may be assured either by the proportional dominance of some one shade to which all others are consistently keyed in subordination or the result may be obtained by a distribution of two or more colors that combine in a textural presentation as one color of some generally prevailing cast. Of this latter character are the turquoise appearing domes of certain Persian Mosques which

are really in polychrome tile of intricate pattern. In polychrome schemes this principle of coloring for the field masses carries better assurance of unity than a preponderant mass of perfectly plain color broken only at wide intervals by units of design in other colors which recall themselves by repetition. Here there is introduced the chance that too wide separation or the differing qualities of various materials may not hang well together, and will tend to dissect the design. A design embodying the use of terra cotta panels in marble, stone or brick walls will hold together perfectly if well done while uses of trim differing markedly from wall surfaces both in color and texture are, of course, customary and achieve the same result. In fact, such differences may be necessary to avoid monotony and properly express structural design but in general it will be found true that in polychrome schemes unity is best realized by carrying the colors used in polychrome ornament throughout the field also in some degree or manner duly subordinating their appearance there to the prevailing mass shade and to the focal points in their use occurring in the features of polychrome ornament. Sometimes this may transpire in the normal variations of the mass of field color occurring in the shade of each unit, as with certain kinds of brick, natural stones, marble, and terra



Edison Shop, 473 Fifth Avenue, New York City

Shupe & Bready, Architects

This building is on the whole a most notable and successful instance of polychrome coloring. The window opening features are developed richly in gold with polychrome treatment focusing in the frieze above, and space under the projecting eaves. Material is terra cotta and would have exhibited a more consistent use of this medium had the arched entrance been conceived less in the spirit appropriate for stone design



Detail, Administration Building, Essex County Park Commission, Newark, N.J.

H. Van Buren Magonigle, Architect

Seal brown Terra Cotta with variegated rug texture brick, buff to purple. Frieze, painted canvas decoration by Edith Magonigle in deep blue, black and gold. Ceramic treatment is preferable for such features where not protected, as in this instance, by widely projecting eaves



cotta, which recall corresponding shades in the ornamental features occasioned by shadow. Again, as with terra cotta, when this is used for ashlar as well as ornamental detail, it may be had through many of the varieties of mottled finish obtainable in terra cotta whereby the colors, or some one prevailing tint among them, may be carried through the field in this way. As a treatment such mottling partakes of the character of the brush work employed in the school of painting popularly known as "impressionistic" and exemplified in the paintings of Claude Monet and the American Painter Childe Hassam.

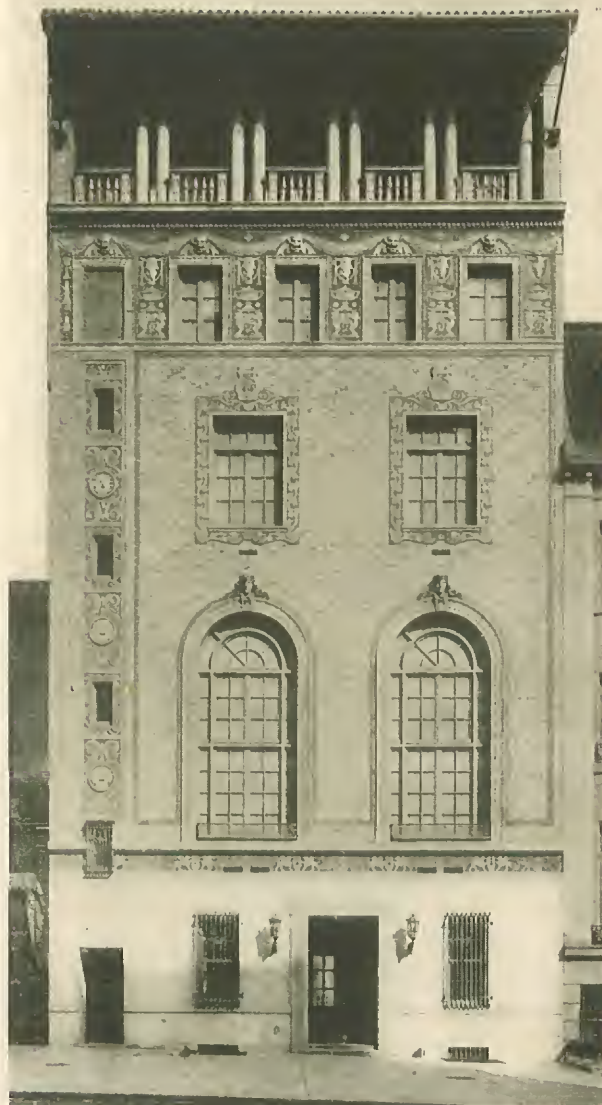
Much the same distributive effect occurs in the black and white mottlings of various stones, granite particularly, and it is doubtless this consideration which to some degree dictates the tendency of many architects to demand imitations of granite in terra cotta. Color mottlings more distinctively ceramic can be had however in terra cotta and admit a richer interest than that of black and white or their blending into sombre gray effect.

Obviously it will be recognized that mere physical distribution of color alone in this or any



Entrance in polychrome terra cotta, Children's Hospital,  
San Francisco, California  
Bliss & Faville, Architects

This doorway illustrates a very free adaptation of Della Robbian precedent. The colors used are light and dark creams with white for relief, against backgrounds of buff, with touches of red in the dentils. Background of figure panel, gray green. Twisted columns, twisted molding in arch and discs of frieze, green. No attempt appears to have been made to hold literally to the customary use and distribution of color found in original Della Robbian terra cotta work. The latter is almost wholly in bright enamels, the art of producing matt finished enamels here used being then unknown



The Chalif Studios, 163 West 57th Street, New York City

G. A. & H. Boehm, Architects

This building is an example of a very successful polychrome treatment. The base is South Dover marble of an ivory shade, the walls above being manganese brick in warm gray with architraves, paneling and frieze of polychrome terra cotta treated in ivory, golden yellow, soft sienna red and light green. Relief in the main is very flat. The whole ensemble is in beautiful harmony illustrating admirable restraint and an appreciation of subtle values

repetitive way will not hold a chromatic result together if the colors employed are out of key with each other. The relationship of individual color notes and masses of color to each other in what may be called the octaves of composition has to be considered and nothing struck out of key.

#### HARMONY AND RICHNESS

With unity assured the fullest chromatic richness becomes possible without offense to the eye or the most conservative æsthetic taste. What offends is not brilliance and richness of coloring. It is harshness and lack of harmony. An oriental rug may carry the splendors of an Ara-



bian treasure chest in amethyst, ruby and sapphire coloring yet take its place perfectly without clash in any soberly quiet interior. So may the front of a building in the grayest of conservative city streets.

Harmony as a basic requirement is necessarily bound up with any unity of effect and in the use of pure and unqualified colors is a matter of well defined law. As the finest relations in this respect occur in the joint use of intermediate and qualified shades no set rules can be formulated as to colors which will and will not harmonize when placed together. Harmony is a complex result and proportionate use for one thing plays a great part in it. Beyond saying that colors must exhibit consistent "quality" it is impossible to say what will and will not harmonize among them. I know of no two colors which cannot be so qualified in character that, while still justifying their original designations, they cannot be made to harmonize, even such unlikely combinations as brown and pink.

In general it is well however for uses of color to proceed conservatively in the employment of a few simple shades of familiar harmonious quality until mastery of more complex relations has been obtained through eye practice but we should dismiss at once that form of timidity which reduces the positiveness of coloring to washed out versions of colors in the hope that their weakness will avoid offense and give a "safe" result. The most ænemic version of any color in the palette may exhibit a harsh and unpleasing quality. In water color, for instance, a raw harsh blue will remain a raw harsh blue, dilute it with water as we may.

In this connection, atmosphere and sunlight are often good friends to a composition reflecting these characteristics. The carrying power of certain colors as appearing in samples of material at close hand will often be found to vary widely under these influences, tending in the main toward reduction of intensity, as in the case of blues at a height and the mellowing and pulling of all together into agreeable harmony.

## APPLICATION OF COLOR TO ORNAMENT

In general it will be found that polychromatic treatment of ornament admits, and in most cases, makes preferable, a lower relief modeling than would be advisable for the same form if executed in monochrome. In the latter, shadow must be relied upon to define pattern to greater or less degree. With a colored background relief ornament is thrown into definition by color contrast mainly. The presence of too much shadow blending with the usually darker color of the background tends to soften and in some cases obliterate definiteness of pattern. It may also tend to obliterate form. Modeling therefore should proceed with the view to the use of color contemplated, especially in a polychrome feature. This may involve the question also of separating adjoining shades of strong contrasting colors with a fillet, carrying the ground color between them after the manner frequently pursued in polychrome ornament by the ancient Greeks; or in ceramic mediums, by raised edge terminations to certain spaces sufficient to arrest the flow of glaze in firing without showing actual separation to the eye.

Various refinements may be employed to give or emphasize the significance of retreating and advancing surfaces. It is a well known axiom of the painters' studios that "indoors, lights are cool and shadows warm; outdoors, lights warm and shadows cool." The application to problems of exterior and interior color treatment in architecture is evident. Similarly adjoining masses of color may be made to assume greater or less degrees of warmth by contrast of qualities in this regard. They may even be given an appearance of a different cast of coloring, a vivid spot of red, for instance, which is the complement of green, intensifying the latter or imparting a greenish cast to an adjoining gray.



Dancing—Terra Cotta Frieze Panel, Boston Opera House  
Bela Pratt, Sculptor—Wheelwright & Haven, Architects  
Color—Background, Blue Green—Figures, Ivory





Peoples Savings & Loan Association, Sidney, Ohio

Louis H. Sullivan, Architect

Nowhere is the daring genius of Louis Sullivan more strikingly shown than in his employment of brilliant polychrome coloring in the housing of a financial institution. The same decision with which mass and line have been handled characterizes the use of color. Orange and brown Terra Cotta in trim and parapet culminating in mottled gold glaze window frames and mottled green glaze ornament of entrance combine with the brick in an effect of great richness. An appropriate feeling of rugged massive structural strength dominates this positive use of color in a degree wholly consistent with the requirements of good architecture and the institution's purpose

#### AVAILABLE MEDIUMS

IN considering the various mediums which may be used to express color in the form of polychromatic design clay products are the most prolific in yielding resources for the most varied treatment. Under this heading we have many beautiful shades of brick carrying a number of interesting surface textures, ceramic tile in a multiplicity of glazes and decorative designs, several shades in glazed and unglazed roofing tile and faience and architectural terra cotta in a great variety of surface finishes, textures and colors, both glazed and unglazed. All may be used together and in conjunction with certain stones and highly colored marbles in effects of the most sumptuous richness. Excepting in terra cotta the use of any one medium alone for complete color effect carries a chance of inorganic formal expression as there are features in design and ornament not possible to realize in brick nor in tile owing to the small and uniform character of their unit construction and consequent scheme of jointing. In tile the color range is very wide but its essential character as a veneer forbids its use to express organic construction in form. Terra cotta is not subject to this

limitation as it may take the form of veneer or be produced in the special shapes, sizes and modelled relief essential for organic constructional expression. Diaper patterns, for instance, in uniform pieces of about twelve inches or greater dimension may be employed for the field of wall surfaces giving a tile veneer effect and can be combined with architraves, pilaster, cornice, bracket, and sculptural ornamentation in the great variety of form in which these elements occur in various styles. Owing to this flexibility for formal expression the use of terra cotta for practically the entire finish of a façade becomes possible without carrying the feeling of a too wholesale use of one material or a use which does violence to its nature in certain parts of the design.

#### THE INTEREST OF COLOR VARIATION

IN considering the uses admitted by the very wide range of colors and textures obtainable in terra cotta the natural tendency of all ceramic products to exhibit a certain variation of shade occurring in the process of firing should be recognized as one of the greatest sources of charm available for interesting chromatic effect. The history of brick manufacture illustrates the enormous pro-



gression in taste from the era of the uniform, smoothly finished, red pressed brick with its immaculately painted white stripe joint, so lavishly employed in the early seventies, to the pronounced variation of shade, texture and uneven form of the most deservedly popular varieties in use to-day. In roofing slate we have also gotten away from the smooth, uniform color and size once demanded in this product, and recognize the overpowering charm of the irregularly mottled weathering slate with broken edges in differing thicknesses and sizes which our quarries are now yielding to the great enhancement of our country house architecture.

Similarly in terra cotta and other lines of ceramic material it is to be hoped that the slight eccentricities of fire will be allowed to assert themselves more freely and that the present standard of taste in using terra cotta which reflects too much the attitude toward brick in the early seventies will yield to an appreciation of the finer possibilities obtained through exploiting the natural variations of color and slight inaccuracies of form incident to ceramic manufacture rather than wishing to suppress them. When architects at large will express their conceptions in terra cotta with the crisp freedom of a loosely handled water color in wash we may look for results of incalculable significance and beauty in the architecture of our time.

This applies not only to effects in polychrome design but to schemes in which the color interest is

that of simple monochrome treatment. In the first chapter it was pointed out that the proper application of the term "color" covers the chromatic result of the entire building and not simply those details which are executed in polychrome. As no building erected fails to present an aspect of color it suggests a word upon the element of form in ornamentation as contributing to this color aspect in the characteristic of shadow which must necessarily modify the tonal effect.

The choice of material determines in large measure the value and influence of shadow color in the chromatic ensemble. The varieties of soft stone commonly used in Spain for many of the most interesting and rich examples of Spanish renaissance were of a color that, under the brilliant sunlight of the Spanish climate, glowed with an appealing warmth casting shadows of a deep golden sienna that are in themselves positive color notes of the most charming quality. Naturally such profuse opulent richness of ornament in such a medium provides an interest both of form and color which does not need the further enrichment of applied polychrome coloring to realize a quite sumptuous chromatic quality. That

this latter, however, occurs largely through the warmth of actual coloring of the stone itself is apparent in the fact that the golden quality of shadow is occasioned largely by reflected warm light from the parts illuminated by sunshine. A corresponding elaboration of carved treatment in a cold, gray variety of material would



Above:—Upper part of an ancient villa near Varese, Italy  
Below:—Similar portion from an ancient villa near Saronno, Italy. From restorations by Federigo Lose

Interesting examples of the use of painted polychrome decoration of the year 1487 A. D. Colors used were pale buff and warm putty gray for backgrounds, with ornament in strong reds, greens, blues, yellows and brown. Openings are nooks for birds to nest in. These houses had lapsed into an advanced stage of decay and debased use about 1867 when restorations were made and decorations are no longer recognizable (From *The Terra Cotta Architecture of North Italy*. London, John Murray)



occasion a shadow lacking in this positive effect of glowing color, being apt to take on a cooler cast of gray emphasizing the absence rather than the presence of color. Thus the nature of material must to some degree govern the result in counting upon the effect of shadow as an element of chromatic interest.

It is apart from the purpose of this treatise to discuss the weathering of material as an element of color interest. Its charms in the varieties of products susceptible to it are altogether too well

the conditions of local atmosphere in the greater part of it, the materials which are commonly available for monochrome effects do not carry the qualities which produce the luminous shadow that can count as a distinct color note. Here again the great variety of warm tints obtainable in our clay products yields a possibility analogous to that carried by the soft mellow stones and marbles of Italy and Spain, many of the ivory and light buff shades in terra cotta and brick holding a wealth of shadow color of the most sumptuous richness.



Loew's State Theatre, Yakima, Wash.

Marcus B. Priteca, Architect

This building illustrates the possibility of obtaining effects of great richness with marked simplicity of treatment in the use of broad masses of plain color. Materials used, Terra Cotta and brick. This design also visualizes well in marble or limestone with brick and in any scheme from white to ivory or pale pink combined with gray, dark buff or old rose coloring for the brick pattern

known to need description and they are moreover something which are not within the power of the architect to manipulate. They can be counted upon with fair certainty but must await the touch of the subsequent collaborator, Time. They cannot, therefore, be brought under the principles governing the preparation of design in polychrome as commonly understood. But it would be misleading to infer that the possibilities of color interest rest entirely in the use of polychrome composition. While true that there is no material which does not present the aspect of color of some description it is unfortunately the case that in this country under

#### INTIMATE APPLICATIONS

THE foregoing chapters have dealt entirely with the subject of exterior color in architecture. The chromatic treatment of interior design is a subject in itself which does not fall under the use of color as contemplated in this treatise. Nevertheless, materials which are used for exterior finish are so often applied to the permanent architectural features of interior spaces that a few words may well be added upon certain aspects of design in this field.

The merits of our various native stones and American and European marbles, particularly the





Portion of Facade, Academy of Music, Brooklyn, N. Y.

Henry B. Herts and Hugh Tallant, Architects

Color of brick, warm buff gray carried through Terra Cotta relief against backgrounds of deep yellow, blue and green. Distribution being much broken up and associated with very full relief, the polychrome coloring serves mainly to enhance textural interest. Buildings so treated may soon lose the interest of chromatic variety owing to the obscuring action of dust deposit





Corner of Porte Cochere of a private residence on Long Island

H. Van Buren Magonigle, Architect

Brick, Terra Cotta, marble and roofing tile combined with notable color success. To uphold a desired intensity in the mass coloring of brick against the graying effect of mortar joint 8" stretchers were combined to give the effect of 16" units in Flemish bond. Colors ranged from buff to rose, deep red and purple. Terra Cotta arch with design in prevailing mass shade of brick against yellow background to tie with yellow marble columns. Soffits of arch blue. Bed molding of cornice, Terra Cotta with blue panels. Roofing tile takes up brick coloring with addition of green. Well is Verona marble of rose and yellow coloring



richer colored varieties of these, are altogether too well known to require more than passing mention as familiar resources for chromatic effects in such applications. To some degree this is true also of the better lines of cement and other composition finishes widely employed in various appropriate ways. Knowledge of technique in all these familiar mediums requires but little, if any, amplification. But in the employment of ceramics as a medium for color expression there is a field of fresher interest which may be profitably explored in certain essentials not always realized in the use of this class of materials.

In common with the attitude which has largely characterized the employment of terra cotta for exterior use, the demand is too often to express the interest of marble or stone effects in form, color and surface texture, rather than striking directly for the equally high quality which a ceramic medium is capable of giving in its own way. The broad principles enunciated for the use of mate-

rial in exterior design apply equally to interior work, some of them assuming very acute importance under the intimacy of application and proximity to the eye. This fact is generally well appreciated and it is perhaps due to the influence of more familiar habit in employing color for interior uses in other mediums that the handling of it in ceramics for interior applications has been attended with a little more freedom and confident decision. In fact, certain freer uses of tile work have inclined too much toward the wholesale employment of ceramic finish for entire interiors, floors, walls and ceilings, to the exclusion of the richer interest that might have been obtained by a judicious association of ceramic finish with the contrasting and supplemental qualities of other mediums. The beauty of ceramic modeling in its softness of contour and the free flowing plasticity of design which should accompany it nowhere receive a more effective foil than when intelligently related to the chaste purity of line, edge and sur-



Columbia Theatre, San Francisco, Cal.

Bliss & Faville, Architects

Strength of conviction in the use of color and appropriate conception are well exemplified in this building. The facade is in Terra Cotta of a rich cream white, the ornamental features of the first story windows being lavishly treated in deep olive greens and blues with tracery relief in shades of old gold. The upper stories are appropriately treated in lighter shades of old rose, green, blue, light browns, old gold and buff. Color ensemble is well tied together and assisted by the spotted distribution of color in brick pattern





Detail of market building illustrated on opposite Page

Design is thoroughly ceramic in character, color distribution being as follows: Prevailing body color, pale ivory; large square units in diaper pattern, deep ivory; lattice, light green with old rose spots at intersections; oblong panel surfaces of pilasters, light blue alternating with old rose inserts; columns, capitals, doorway architrave, paneling above and cornice recalling this coloring in minor detail





Torrance Market Building, Los Angeles, Cal.

Dodd & Richards, Architects

One direction in which the use of polychrome coloring would confer a lasting obligation on a long suffering public. Contrast this dignified and attractive result in Terra Cotta and roofing tile with the usual unsightly structures for this purpose with which American cities are generally afflicted. For colors used see detail illustration opposite

face finish which is the consistent attribute of marble. The latter used as a bordering feature often enriches the opposite charm of free plasticity in the ornamentation of a tile field. Again the relation may be equally fine when reversed, the ceramic material being used as a border in highly rich ornamental relief and the enclosed space kept severely plain. Decorative sense in the designer must determine the extent or even fact in this relationship rather than any fixed rule or theory. A scheme of design may well call for the textural interest of ceramic surface and jointing as an element to be carried throughout the entire wall or floor space in an all ceramic treatment but in general it will be found that the eye seeks relief at some point through the differing qualities of a different medium and it is in this respect that the early European uses of material are so highly satisfying. The significant thing to be noted is that in instances where ceramics were employed they appear to have enjoyed the highest measure of appreciation as a fitting vehicle for the most elegant effects in palatial treatment and that we do not find the *gaucherie* of view which regards only the most costly mediums as appropriate for such results. It is quite clear that della Robbia worked in glazed clay from preference and that many of the applications of his brilliant genius were desired in his favorite medium of ordinary clay—

common inexpensive earth coated with colored enamels. The fact is significant when viewing the resources of his time in the liberal patronage of princely houses amply able to pay for use of the most expensive mediums for sculptural and decorative effect.

That this attitude did not apply merely to individual works of art in which the concept of the sculptor or painter was everything and the medium used of minor consequence is evident from the many applications of della Robbian faience to purely architectural uses in the finish of ceilings like that of the Chapel of the Madonna in the Impruneta and various tabernacles, ornamental friezes, etc. While these instances were usually of minor extent this was due clearly to the fact that the knowledge of how to apply colored enamels to architectural forms rested wholly with a family group of individual craftsmen not enjoying the facilities for extensive production in this direction. Otherwise we may be sure that the wonderful resources of their art would have been used to beautify extensively both the interiors and exteriors of many of the noblest structures of the time. This is borne out by the fact that contemporary Italian architecture of the period exhibited a widespread use of terra cotta lavishly colored with impermanent pigments which naturally would not have been employed if permanent glazes had been commonly available.



# PRECEDENT AND INITIATIVE

THE della Robbia family and their immediate successors did not know how to produce a matt surface glaze, much less one having any textural interest. This circumstance suggests another aspect in the resources of modern ceramics for appropriate finish which are open to the architect today. All the examples of the della Robbian school are in smooth bright enamels having a glassy sheen which tends to obscure form by its reflecting action, particularly in its susceptibility to glittering high lights. The original enamels of Luca della

Robbia were somewhat softer in this respect than those of his successors but still embodied this drawback to the most satisfying expression. Had Luca known how to saturate his glaze compounds with elements producing a minute crystallization of the surface which eliminates the glitter he would certainly have turned to this resource with the most unbounded enthusiasm. It is in this development that modern ceramics present a medium surpassing that employed by della Robbia. In modern terra cotta and tile matt as well as bright glazes are freely obtainable and in surface textures of the greatest charm. Added to this are



Altar in Holy Trinity Roman Catholic Church, Newark, Hughes & Horton, Architects  
executed in polychrome Terra Cotta, Mosaic and painted decoration



the very much greater range and variety of colors which the modern ceramic chemist has developed. With this increased facility for harmonious expression the matter of equal or superior results reduces itself to the quality of the architect's design and sculptor's modeling and is not a matter of rediscovering the secret of "a lost art" or of a medium of comparable excellence.

The very much greater range of possibility in ceramics now offered the designer suggests another point very vital to the appropriate and significant use of color in modern applications and one that applies whether the material be ceramics or any medium that may be employed for polychrome design.

Allusion has been made to the ample precedent which exists in the practice not only of the early Italians but of the ancient Greeks. It is natural that in any use of the classical orders, particularly the pure Greek, we should turn to the bright colors and shades of colors employed by the Greeks and apply them in the same way. Any use of the corresponding black, dull and bright reds, blues, brilliant yellow, gold and pure white should hold with

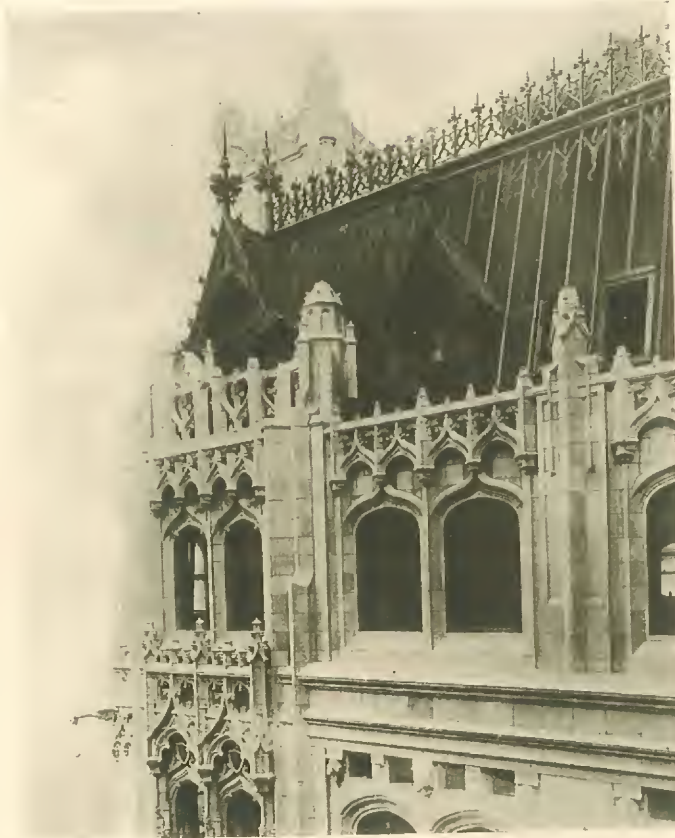
certainty to the method of distribution which modern research has established as characteristic of polychrome expression in Greek architecture. In fact, it is reasonably certain that the use of coloring was so studied and brought to such a state of final perfection in its technique that no departure in the use of corresponding colors could safely be made. But there is this very significant and vital factor to be remembered. Such perfection of color technique must have rested inevitably upon the precise shades in coloring which the chemical knowledge of the ancient Greeks admitted producing. A virile strong race naturally found satisfaction in the use of positive strong colors and

if not indisposed was at any rate unable to develop in the necessary mediums the wide gamut of subtle intermediate variations of color obtainable under the resources of more advanced chemical knowledge. Greek vase painting, for instance, exhibits none of the chromatic variety of ancient Chinese porcelains or Persian tile work nor do we find that the art of glazing their terra cotta extended beyond a process and result that more properly resembles burnishing. It is an

interesting question what the Greeks would have done had they possessed facilities for the production of ceramic glazes in the wide range of various colors and intermediate shades of colors that exist today. Is it not probable that a race of such wonderful æsthetic sensibility would have quickly seized upon such resources and if their use of colors in relation to form was influenced, as it must have been, by the characteristics of those colors, would they not necessarily have employed the differing colors and shades of a very much wider palette in a different way? One can scarcely conceive that they would not have used them at all and that the only shades they would have employ-

ed were precisely and identically the ones they did. They would have used electric light and changed their fixtures quickly enough if they had known how; and in the use of color who shall say that the road is not open to the modern architect to associate successfully the differing colors admitted by a modern palette with Greek or other classical ornament in a manner which the ancient Greeks would have accepted as perfectly satisfying? The possibility, of course, rests in an imagination gifted enough to do it successfully within the immutable principles which govern form in Greek art.

Correspondingly a slavish adherence to Persian,



Detail of upper stories, Woolworth Building, New York City

Cass Gilbert, Architect

Color interest focuses mainly in the relation of cream colored Terra Cotta seen against the green and gold copper of main roofs and termination of spire, polychrome accent touches being carried through the Terra Cotta tracery to interlace these masses in the upper stories



Arabic, or early Italian precedent in the use of color is nowhere enjoined by the facts of history or dictates of sound taste, admitting that in a repetition of any of these motives in design the law of association in mental process calls for a substantial adherence to the familiar chromatic aspects of such design for satisfaction of the mind in its sense of consistency. Beyond that there is no necessary bar to initiative.

A suitable palette of colors for application to architectural form is therefore not limited to any chromatic scale dictated by precedent. It preferably should include those tints and shades which have been employed in the best architecture of the past, but may confidently include varieties and interests of texture not among those known or available in former periods. Modern ceramics already offer these in an astonishing range of very beautiful effects. In fact, the interest of technique occasionally suffers through a control which eliminates much of the charm arising from the more primitive processes employed in early European and Oriental ceramics. On the other hand, the

compensating advantage of much broader chromatic scope and extent of application together with the facilities for obtaining material with the requisite speed for modern building operations could hardly be foregone for the satisfactions of more primitive charm. It is only in certain rare effects of luster in Hispano-Moresque and early Italian maiolicas and the superb porcelain glazes of ancient China that the modern ceramist has yet failed to excel technically in his production of material suitable for architectural application. The range of colors obtainable, for instance, in architectural terra cotta is given in the appendix and need not be elaborated here beyond saying that the laboratory formulas of the modern American manufacturer contain an infinite variety

of each one of the colors enumerated in the appendix, in consistent gradations of these which can be supplied commercially and that the range is constantly expanding under further experiment. There is no need for the designer to depart from the obtainable varieties for any effect consistent with the nature of a ceramic medium, the problem in its practical commercial aspect consisting rather in the designer's appreciation of the fact that sumptuous richness can be achieved with a compar-

atively simple range of colors and a consistent employment of the warm and cool varieties of each color. But the attempt should not be made to express these in a working design without reference to ceramic samples illustrating the qualities of coloring resulting from the nature of ceramic process. These, it should also be remembered, occur from the action of chemical compounds subjected to a terrific heat for their development and this precludes microscopic uniformity of shade among the units produced in any one prescribed color. Certain composite colors should also not be expected from the compounding of other colors which

would yield these in the mixture of ordinary pigments. Distributive applications of one color over another or blending into another with this view, should therefore not be attempted in design without prior consultation with the manufacturer.

Both in tile and terra cotta as well as in the special developments in the latter which are properly known as faience, the color palette offered the architect today is ample for all purposes whose attainment can be reasonably desired. No difficulty exists in this direction where the desire is not to torture out effects of coloring that belong properly to other mediums. It is not reasonable to hand a manufacturer of ceramics a piece of silk and say "match this" or to expect the same duplication from a piece of wall paper, wood,



Altar in polychrome Terra Cotta for Holy Trinity Roman Catholic Church, Newark, N. J.

Hughes & Horton, Architects





DETAILS OF PRIVATE HOUSE AT BRESCIA, ITALY. FROM THE  
RESTORATIONS OF LOSE  
ARCHITECT UNKNOWN

*(From The Terra Cotta Architecture of North Italy)*

Evidently one of the finest examples of painted polychrome decoration in cement and terra cotta. This fragment is no longer available for first hand study. Note the charmingly harmonious shades of warm gray and the beautiful suggestion for modern ceramic treatment in low relief







United States Post Office, St. Petersburg, Florida

James A. Wetmore, Architect

Buildings of this character present unusual opportunity for effective color treatment. This example illustrates the successful adaptation of Italian precedent in a thoroughly modern treatment. Material is ivory Terra Cotta in low relief, enriched with light blue, yellow and green. Ceiling of the loggia is consistently treated in polychrome, blue predominating

stone, marble or other substance when the material to be used is clay and when almost no color presented by any other substance fails to find a corresponding equivalent as color in the ceramic medium associated with a distinctive quality peculiar to the ceramic medium and constituting its essential dignity. The fact that the producers of ceramics have succeeded in many instances in successfully matching the characteristics of other materials under an enforced demand for this result in nowise changes the fact that the sincere designer will always prefer to use a material frankly for what it is and has ample resources for satisfaction in the profuse variety of effects which modern ceramic production now affords.

A word may be added in this connection respecting the exceedingly interesting possibilities offered by ceramics for pictorial mural decoration. Aside from the beautiful results in mosaic which are commonly

familiar the possibilities of this in tile treatment are not as well understood as they might be. Demand in this direction has exhibited on the whole a somewhat curious lack of appreciation of the immense dignity of effect obtainable, with certain rare exceptions having inclined toward common-

place concepts, and a whole chapter might well be written on this subject which pertains rather to that of interior decoration than the architectural use of color in a broad sense. Faience in the natural medium where particular subtleties in color relationships and technique generally are beyond the customary process in both terra cotta and commercial tile production, involving the use of lower fired glazes and a greater expenditure of hand labor, time and cost than is possible in the bulk production of material for customary building work. The expense is also necessarily greater and the extent of application therefore limited to opportunities relatively unfrequent,



Terra Cotta Filling Station for Atlantic Refining Company, Philadelphia, Pa.

W. J. Wilkins, Architect

While treatment in this instance is monochrome it is easy to visualize buildings of this character in color. Not only does Classic precedent warrant the brilliant enrichment of detail in this style but the purposes of such a structure and the essentially modern activity it is designed to serve admit the widest latitude in the choice of architectural style and play of fancy in chromatic enrichment. With landscape accessories the filling station could be made an attractive beauty spot and an important element in municipal planning



Temple B'nai Jeshurun, Newark, N. J.

Albert S. Gottlieb, Architect

An interesting example of the intermingling of burnt clay products of varying textures and color. Materials, unglazed tile and Terra Cotta in varying shades of brown, with altar of marble



but in the wider use of color which will give our architecture at large a more pronounced and appealing chromatic interest the materials available for use are generally well within the bounds of cost admitted by our prevailing conditions.

Finally it may be said that notwithstanding

the rapid strides which our architecture has made away from the lifeless uniformity of the "brown-stone age" the resources for color treatment as they exist in all our native materials have hardly been scratched and that an opportunity of the utmost promise awaits a talent that will make the most of it.



Tower of the Hecksher Building, New York City

Warren & Wetmore, Architects

Polychrome treatment in the design of the modern skyscraper has inclined toward detail enrichment of the upper stories in the typical manner shown by this example. Brick is a warm gray, this color being carried through terra cotta in lighter and darker shades which serve chiefly to emphasize the richness of ornamental detail rather than carry as positive chromatic composition. This result is apt to follow in any broken up use of pale shades at a corresponding height from the eye.

View in this instance is taken from the roof of an opposite building



Detail of Terra Cotta modeling in arched windows of the Ospedale Maggiore, Milan

The irregularities of finish in burnt clay frankly accepted by the early Italians are nowhere better illustrated than in this instance. Note the soft contours and irregular edges and jointing. The modeling expresses perfectly the plastic nature of a clay medium under the direct touch of the hand. Coloring is also the natural result of the firing in its variations, which range from red to golden brown, burnt orange and sienna. This work was executed about the year 1460 A. D. and is still standing



## APPROPRIATE TECHNIQUE

**S**UPPLEMENTING the foregoing chapters, a word should be added upon certain aspects of technique in the use of the clay products which today offer the principal opportunity for color expression.

Clay becomes usable for building purposes only after it has passed through a firing process reducing it to the necessary hardness. In this process all perishable substance in the clay is consumed and as the latter is a natural product, however refined by preparatory treatment, irregularities of form are bound to occur in the shrinkage resulting from this consumption. From what has been already said about variations of color similarly occurring, this corresponding formal limitation should be frankly accepted as belonging to the very nature of things in a ceramic product. Consistency in the use of such a medium requires that its nature in all points should be regarded, and coloring which is frankly ceramic demands form which is frankly ceramic. Similarly the quality of modeling in ornamental design should be that naturally yielded by the nature of wet clay before being dried and burnt. Wet clay cannot be chiseled and given the sharp edges of a finely grained marble or stone. The rigid character which is inseparable from the carving of a hard resisting substance has no place in the modeling of one which yields with the most plastic freedom to the touch of the bare hand. Yet we find everywhere a demand that modeling in a product like terra cotta shall be finished "sharp and true," the result being that it often presents an aspect of

mechanical rigidity entirely antithetic to the feeling of a yielding clay reduced to intense hardness by the freely playing action of flame.

The same applies to the results commonly demanded in jointing and alignment. An exami-

nation of the terra cotta work of the early Italians shows that they took their material as the kilns gave it to them, neither worrying about the frank presence of the necessary jointing nor seeking to reduce this to mechanical accuracy through grinding or other arbitrary treatment of the fired pieces. The result was that while their alignments and curves were to some extent broken and irregular the effect, when associated with a consistently free treatment of modeling, exhibits all the charm of a freely handled crayon drawing and it is this spirit which is appropriate to design in a clay material both in the treatment of form and the handling of color. On a previous page reference was made to the feeling of a loosely handled water color in



Detail from an ancient Italian villa illustrating free treatment of Terra Cotta in line, form and finish, these qualities occurring naturally in the manufacture. Color is red, unglazed. The somewhat similar modern application shown on page 33 affords an interesting study of comparative effect in these points

wash and this we do not commonly associate in rendering with the tight precision of nicely finished pen drawing for the expression of line and form, much less any embodying use of the ruler and compass in the final touch. Clay mediums, in other words, present a possibility of realizing in actual construction the charm of free hand feeling which is often the compelling interest in a rendering—one that not uncommonly captures the imagination of the client (and sometimes a jury). We all know what a highly artistic drawing may convey in



comparison with the coldly realized actuality of its execution in a building it is aimed to portray.

In this connection, some of our most accomplished architects have gone to extreme pains to secure in executed work results reflecting all the

what will result under fire action has been largely eliminated. In chemical structure and the compounding of materials a similar certainty of command has likewise been achieved. In the manufacture of terra cotta, for instance, it has been found that by grinding and adding to the



Detail of entrance, Clawson School, Oakland, California

J. J. Donovan, Architect

Illustrating a flat treatment of Terra Cotta in mottled gray matt glaze. (Design is equally appropriate for polychrome treatment)

charm of early primitive process in various applications of tile and terra cotta. The difficulty that has been met in this respect has lain chiefly in the fact that technical improvement in all lines of ceramic production has resulted in bringing these mediums to the point where uncertainty in

raw unfired clay a certain proportion of fired clay the unequal shrinkage formerly encountered in firing is largely overcome and the ware can be given a truer form and more even size than were formerly obtainable. Larger pieces can also be made, and in other respects a correspond-



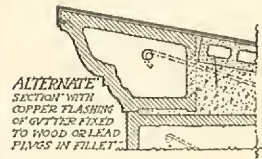


Wetzel Building, New York City  
Hill & Stout, Architects

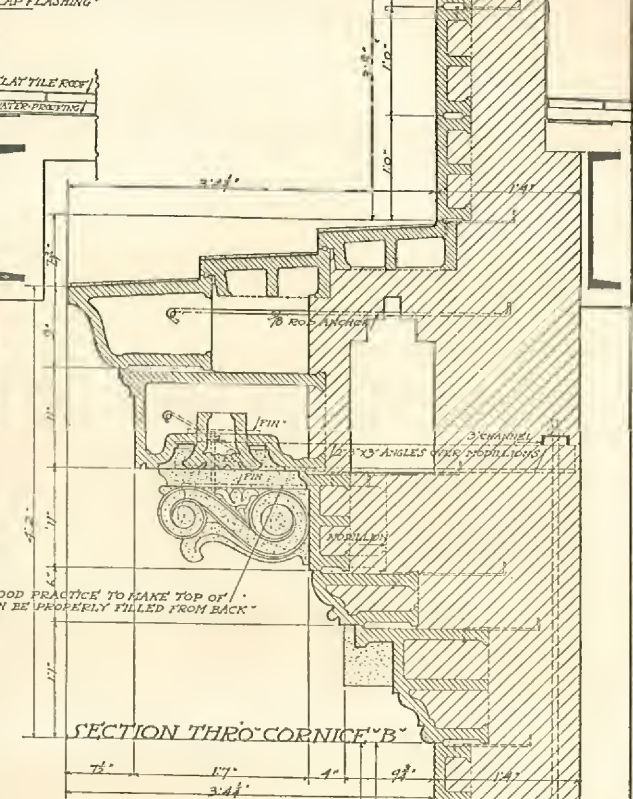
This well known example embodies detail treatment well repaying study. Polychrome interest has been closely associated with that of very rich textural charm in the brick and plastic hand made freedom of unglazed Terra Cotta ornament. Varying shades of soft golden brown in these materials are further set off by richly colored polychrome accents in glazed tile. This tile also exhibits the free, hand made quality of early ceramics



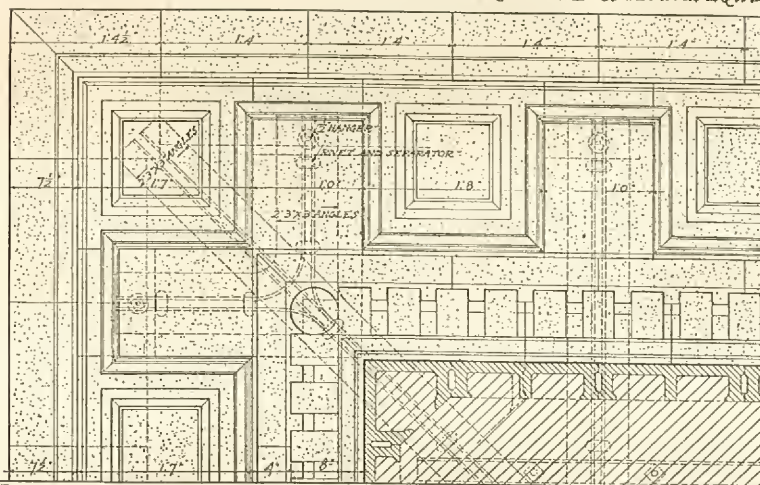
SHOWING METHOD OF 'SUPPORT'  
AND ANCHORAGE -  
CONSTRUCTION OF 'GUTTER'  
DRAINAGE 'ETC'



SHOWING METHOD OF SUPPORT  
AND ANCHORAGE ~  
LAP-JOINTING OF WASH ~  
SOFFIT CONSTRUCTION ~



SCALE 'THREE' QUARTERS OF AN INCH EQUALS ONE FOOT



(Reproduced from "Architectural Terra Cotta Standard Construction")



ing technical improvement of the highest practical value has been reached, greatly increasing the scope of possible applications. In all ceramic materials a technical advance of the most pronounced nature has been made in modern times and this fact must be recognized in developing any vital and appropriate technique for these mediums. We cannot go back to the individual craftsman basis of limited hand production and crude process which has yielded so much of surpassing charm in the ceramic work of past periods. All we can hope to do is to recover so much of this lost quality as is compatible with the necessary

missible in certain specific mediums. But very little may be said in relation to the case of brick, especially the glazed varieties which may be included under the term ceramic material. The rigid limitations of the brick making process present no possibility of employing brick in any other way than frankly as brick. The jointing will always so announce it even where moulded varieties are employed. One circumstance in the employment of modern brick stands out in very significant illustration of the permissive aspects of the principle formulated above. In certain varieties of unglazed brick effects are



Main entrance, Ceramics Building, Rutgers College, New Brunswick, N. J.

Doorway, consoles, cheeks and balustrade in buff terra cotta enriched with polychrome in the entrance reveals. Walls in selected common red brick. This building, devoted to education in the production of ceramic materials, is constructed almost entirely of burned clay products. Illustration by courtesy of "The Ceramist"

conditions of production today and which lends itself naturally to the very much wider scope of use which the present development of ceramic mediums admits.

#### LEGITIMATE EFFECTS IN TECHNIQUE

From this fact we may formulate the following definite principle of technique: *A fundamentally correct employment of any material is the use which can be made of it in design without doing violence to its essential nature.*

Application of this principle brings up at once the question of what is permissible and not per-

being obtained variously designated as "tapestry" and "rug texture" surfaces. A literal construction of these terms to mean the duplication in brick of exact characteristics of pile or weave so as to present the appearance of a woven fabric would seem to involve the utmost insincerity and inappropriate conception of medium. Even a similarity sufficient to justify use of the terms "tapestry" and "rug," etc., which are employed for want of words equally convenient and accurate as description, suggests the idea of imitation which is so repugnant to the sincere designer. But is there after all any real basis for





Examples of modeling in unglazed buff Terra Cotta which express well the quality and feeling of clay work

Warren & Wetmore, Architects

this objection? The suggestion of tapestry or rug fabrics in color and texture is quite readily obtainable under the modern process of brick manufacture. Their realization involves no straining of the nature of material, no forced inappropriate process or impracticable expense, but is something which is now quite naturally possible to the clay medium and as the approxi-

mation of effect does not include any yielding softness of the surface to the touch there is nothing in the problems of good formal design which forbids use to express significantly and consistently the fact of a solid wall surface. The obvious jointing, if nothing else, disposes of that. A "tapestry" or "rug texture" brick wall cannot be anything in appearance but a brick wall not-



Terra Cotta panel for Chapel of St. John's Hospital, St. Louis, Mo.

Barnett, Haynes & Barnett, Architects

Field in deep blue with gold stars; figures and border in warm gray. This design illustrates a simplicity not only in line with the best early precedent in ecclesiastical decoration but appropriate and economical for Terra Cotta



withstanding the implication of these terms and the duplicating effort they may imply.

In the case of terra cotta, however, effects approximating other materials in color and texture, however naturally produced, encounter no such safeguard for preserving the identity of this material as we find in the rigid limitations of familiar brick jointing and where the design of ornament deliberately seeks to repeat the rigid feeling of stone carving the casual observer may readily mistake the medium. Limitation to the success of such intention occurs, however, where consistency

designer to determine where a merely visual satisfaction of either kind is legitimate or if the aspect of sincerity in construction calls for the actual fact of larger size masonry units and a consequent selection of material affording this. (If we get too deeply into that we might have to rule out the whole system of clothing steel frame buildings with any covering simulating masonry construction, as the sincerity of that in any form so applied is debatable.)

In this connection, a solution which is growing in favor with progressive architects is that a



Detail of New York Orthopedic Dispensary Hospital, New York City

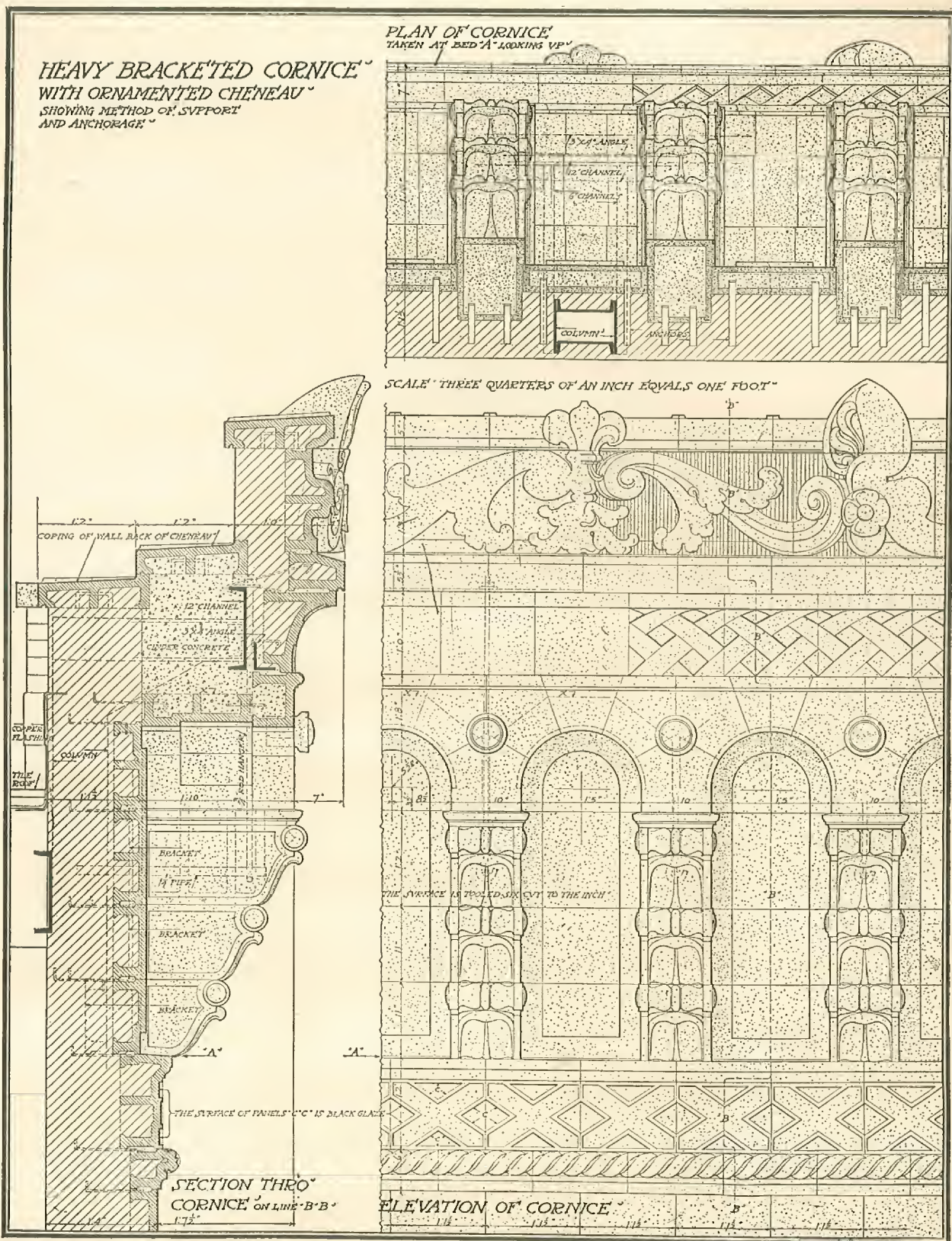
York & Sawyer, Architects

An application of red unglazed Terra Cotta and stucco similar to that shown in the Italian example illustrated on page 27. The suppression of jointing and extreme precision of alignment are qualities commonly demanded in Terra Cotta to the detriment of its interest as material. Recognition of this appears to have led to pointing the joints with white cement to emphasize them frankly. Less regularity would have enhanced the character

in scale calls for monumental proportions in terra cotta pieces which are beyond the possibility of economical production and except where the expedient of concealed joints in certain ornamental features is practicable the identity of terra cotta is evident from its visible jointing. The expedient of rusticated alternate or more widely separated joints often adopted in stone and terra cotta may give the effect of larger units than commonly produced in either, but a difference in shade or coloring readily admitted by a ceramic medium may also be used to satisfy the eye's demand for larger unit interest. It must remain for the

scheme of visible jointing for large wall surfaces in terra cotta may be made to assume a textural interest analogous to that occurring from the jointing of brick when spread over a large surface and as perfectly consistent in structural feeling. The writer recalls several instances of terra cotta construction where, intentionally or otherwise, the use of a moderate size unit readily producible in terra cotta yielded a most satisfying effect in this way. Where conditions admit, this solution appears to be preferable to that sometimes attempted of forcing the production of terra cotta





A heavier type of cornice much more logically suited to the spirit of Terra Cotta and better adapted for color treatment. In Polychrome treatment projections can be reduced by the judicious use of color which can be made to accentuate depth, minimizing the need of shadow  
 (Reproduced from "Architectural Terra Cotta Standard Construction")



into pieces of extreme monumental size which its nature is not capable of readily yielding.

Quite apart from any aesthetic standards there is a practical advantage in the reduced expense of construction which would follow development of a more appropriate technique for terra cotta. Wide projections in cornice and other features of relief depending for support upon hanging devices of iron and steel not only require the most careful detailing for security but illustrate an expense in the total for construction as now encountered that might often be dispensed with. Moreover, they are in themselves not motives best adapted for color treatment. A flatter treatment for a material like terra cotta not only conduces to that absolute durability which is so well attested by early Italian and other uses of it in examples of over 500 years' standing, but is more suited to the spirit of a clay material and in many cases enables a sufficient interest to be introduced in varied coloring to dispense with costly formal con-

struction and its enrichment with expensive detail.

Recognition of this has already produced some recent examples which contain the promise of a very interesting development. In the city of Honolulu, for instance, there has lately been erected an important building covering an entire city block where an attempt appears to have been made to follow a distinctively terra cotta technique in the treatment of jointing, if not, perhaps, so noticeably in other aspects of design. Throughout the entire exterior, which is all in terra cotta, and illustrates an immense use of this material, not a single joint was ground, leaving the soft edge natural to a clay piece instead of the knife-sharp edge given by a rubbing bed as commonly demanded in terra cotta. A frankly appropriate design and treatment conducing to economy in the production of any material has a practical advantage in a time of high building costs, especially where it carries an artistic improvement in the result.



Base of arcade pier in a modern building for Theodore H. Davies & Company, Ltd., Honolulu, T. H.

Louis Christian Mullgardt, Architect

Showing the soft edges of unground Terra Cotta pieces with slightly raked out joints, glaze being allowed to return over the edges. Color, a variable brown glaze verging to shades of olive green

## APPENDIX

**T**HE following shades of color and characteristics of texture are now obtainable in terra cotta as produced in the United States.

In colored glazes the palette includes reds, ranging from a pale pink to deep madder; blues from a light sky blue to cerulean and deep indigo; greens from light emerald and malachite to grass greens and olive shades; yellows from pale shades suggesting Naples to deep ochres; browns from cafe-au-lait to dark russet; light and deep purples of both red and blue cast, mauve and, of course, black and white, the latter including several shades from pure white to a deep cream or buff white. Also toned whites of a grayish cast extending into positive grays of a French and putty quality. These are the shades producible at the regular high firing temperatures followed in the manufacture of terra cotta. Consistent gradations of all of these colors may now be obtained. For certain special effects there are obtainable at an additional cost several other varieties of the colors named which are produced at lower firing temperatures or obtained by additional firings, such as vermilion and gold.

In unglazed terra cotta the ceramic finish is usually in shades of buff, gray, salmon, red and brown. Most of these colors are vitreous. In glazed or enameled terra cotta the finish may be either matt or a bright glassy surface.

Previous to the application of ceramic finish in either glazed or unglazed terra cotta the body of the ware may be given a surface treatment to combine with the color in a desired textural effect. This body surface may be smooth or tooled in from six to eight lines to the inch, or may take the form of a light or heavy irregular drag or combing. Special surface treatments of a pitted or wavy character realizing the quality of hand finish are also obtainable although usually at an extra expense.

The term polychrome when prefixed to terra cotta usually denotes the application of two or more colors to the single piece. It is important that the parts to be treated in this manner be clearly indicated on drawings as the expense is higher than execution in a single shade of color for each unit. (The term however does not denote certain speckled and mottled finishes produced by the intermingling of two or more colors for a ground color to be used without other applied coloring.)

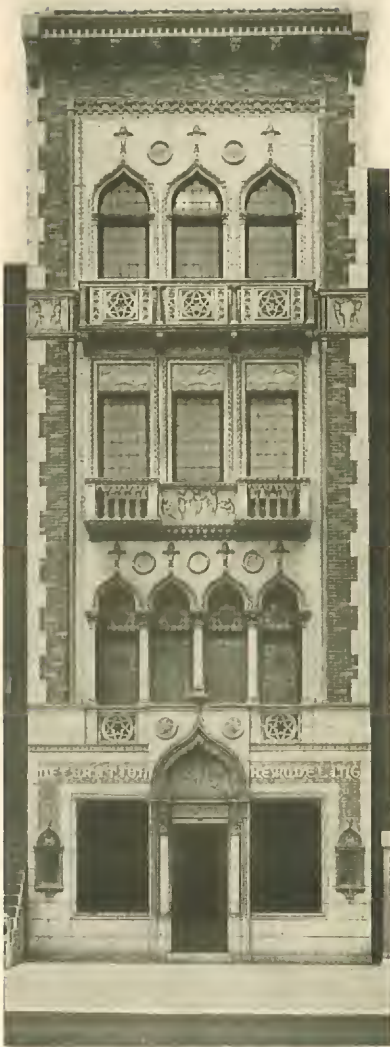


Upper portion of tower, Pantages Theatre Building, Kansas City, Missouri

B. Marcus Priteca, Architect

Positive polychrome treatment of towers has been comparatively rare in this country. From the Central West we have this example in cream enamel and polychrome Terra Cotta indicating a direction in which color can be lavishly and appropriately employed





Building for Joseph F. Sturdy & Company  
Chicago, Ill.

Joseph F. Sturdy, Architect

Progress from the brownstone era in color interest and otherwise is well exemplified in this instance of polychrome architecture in brick and Terra Cotta

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